



STUDENT STRTAEGY GUIDE FOR “ARE YOU BUSINESS SAVVY?”

A unit rate compares the units of one quantity to one unit of the other. Examples include “miles per hour”, “pounds per square inch”, and “price per pound”



The \approx symbol means “approximately equal to”. It is usually used when your answer is a decimal that has been rounded off.

Multiply Decimals

Greg is buying one and a half pounds of shaved ham for his lunch this week. The unit price for ham is \$1.69/lb. How much will it cost before sales tax?

Using UPSL, I get:

Greg is buying one-and-a-half pounds of shaved ham for his lunch this week//The unit price for ham is \$1.69/lb//How much will it cost before sales tax?

One-and-a-half = 1.5 pounds

The price per pound is \$1.69

I choose multiplication since I am using a rate

I count three decimal places in the problem, which I put into my memory. I multiply as if no decimal exists:

$$15 \cdot 169 = 2535$$

I then bring in those three decimal places in the problem and round off to the nearest hundredth (as you should always do when working in money).

$$\underset{\sim}{2535} \approx 2.54$$

The ham will cost \$2.54 before sales tax.



Solving Equations

Miranda is the manager of the seasonal items department. She has 20 candy buckets left over from Halloween and wants to sell them in bundles of four for five dollars a bundle. How many bundles can she make and how much money will they bring in if she sells them all?

Using UPSL, I get:

~~Miranda is the manager of the seasonal items department.~~
She has 68 candy buckets left over from Halloween and wants to sell them in bundles of four //for five dollars a bundle//How many bundles can she make and how much money will they bring in if she sells them all?

She has 68 candy buckets... = 68

...sell them in bundles of four = - 4s

We can write this as an equation to see how many bundles she can sell. My ultimate goal is to know the value of 's', so I must get it all by itself.

$$68 - 4s = 0$$

Using the inverse operation wisely, I choose to add 4s to each side to get all of my "variable stuff" together on one side of the equals sign and all of my "unit stuff" on the other.

$$68 - 4s = 0$$

$$+4s + 4s$$

$$68 = 4s$$

Now, I use another inverse operation to undo the multiplication.

$$\frac{68}{4} = \frac{4s}{4}$$

$$17 = s$$

Miranda will be able to make 17 bundles .

Why -4s?

Every time she sells a bundle, she is selling four at a time; so her inventory shrinks by four. This will continue until she runs out of buckets.



BUT WAIT,
THERE'S
MORE!!!

The second part of the question asks how much money the store can bring in if they sell all of the bundles.

Since we know that they can make 17 bundles and she plans to sell them for \$5.00 per bundle, we can simply multiply to get the remaining answer:

$$17 \cdot \$5.00 = \$85.00$$

The store can bring in \$85 if they sell all of the bundles.

Taxes, tips, and markups **increase** a price. Discounts **decrease** a price.



To convert a percent to a decimal, move the decimal point left two places.

Percentages

Can you help me? I'm trying to figure out if I have enough money to buy these jeans. I wanted to use this coupon I bought from you for your D.C. trip fundraiser on this pair of jeans I've been wanting. I forgot to go to the bank, and I only have \$25.00 cash. The jeans cost \$29.99 and state sales tax is 6% after the 20% off discount is applied. Do I have enough cash to buy the jeans?

Using UPSL, I get:

~~Can you help me? I'm trying to figure out if I have enough money to buy these jeans//I wanted to use this coupon I bought from you for your D.C. trip fundraiser on this pair of jeans I've been wanting//I forgot to go to the bank//and I only have \$25.00 cash//The jeans cost \$29.99//and state sales tax is 6% after the 20% off discount is applied//Do I have enough cash to buy the jeans?~~

Estimate:

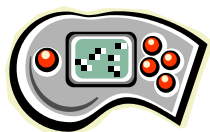
- I will round \$29.99 off to \$30.00 even
- 20% written as a decimal is 0.20
- Since it is a discount, I subtract: $1 - 0.20 = 0.80$
- $\$30.00 \times 0.80 \approx \24
- 6% written as a decimal is 0.06
- Since it is a tax, I will add: $1 + 0.06 = 1.06$
- $\$24 \times 1.06 \approx \25.44

Judging by the estimate, she will not have enough money to buy the jeans.

Actual:

- 20% written as a decimal is 0.20
- Since it is a discount, I subtract: $1 - 0.20 = 0.80$
- $\$29.99 \times 0.80 \approx \23.99
- 6% written as a decimal is 0.06
- Since it is a tax, I will add: $1 + 0.06 = 1.06$
- $\$23.99 \times 1.06 \approx \25.43

Since she only has \$25.00 cash, she cannot afford the jeans unless she comes up with \$0.43



The percentage in a percent proportion should be written as a whole number, not as a decimal.

Proportions

Hey, this game I've been wanting is on sale 40% off! Dude, what is 40% of \$49.99?

For this, you need the most important equation in all of mathematics...

$$\frac{\text{is}}{\text{of}} = \frac{\%}{100}$$

Look at the question again...

...what is 40% of \$49.99?

Two of the three missing parts are all given. You simply plug in an unknown for the part that contains the word "what", since we do not know what it is. In this case, that is the 'is' part. This gives us:

$$\frac{n}{49.99} = \frac{40}{100}$$

Using Mr. Berry's special cross-multiplication technique, we get:

$$\frac{n}{49.99} = \frac{40}{100}$$

$$49.99 \cdot 40 = 1,999.6 \div 100 \approx 19.99$$

So, \$19.99 is 40% of \$49.99.

BONUS: To get the discount price, you subtract that amount from the original:

$$\$49.99 - \$19.99 = \$30.00$$

Your friend can get the game for \$30.00



Percent Change

Ten years ago I bought six gallons of gas for \$8.10. That is a unit rate of $\$8.10/6 = \1.35 per gallon. Last week I bought eight gallons of gas for \$21.52. That is a unit rate of $\$21.52/8 = \2.69 per gallon. What is the percent change of a gallon of gas over the last ten years?

Using UPSL, I get:

~~Ten years ago I bought six gallons of gas for \$8.10//That is a unit rate of \$8.10/6 = \$1.35 per gallon//Last week I bought eight gallons of gas for \$21.52//That is a unit rate of \$21.52/8 = \$2.69 per gallon//What is the percent change in the unit rate of a gallon of gas over the last ten years?~~

The second most important equation in mathematics helps us find the percent change in a quantity - the “NO” method:

$$\frac{\text{New} - \text{Old}}{\text{Old}} = \frac{N - O}{O}$$

Where “had’ is the past amount and “have” is the current amount.

The old amount is \$1.35 per gallon and the new amount is \$2.69 per gallon. Inserting these into the formula gives:

$$\frac{2.69 - 1.35}{1.35} = \frac{1.34}{1.35} \approx 0.9926$$

Converting 0.9926 to a percent gives us 99.26%

The unit price of a gallon of gas has increased 99.26% in the last ten years.